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By Patricia Somers

Researchers disagree on the impact of student financial aid, with the major research traditions in education, sociology, and economics providing conflicting results. The purpose of this research was to develop and test an institutional model to measure the effect of student aid. A comprehensive theoretical model of student matriculation that examined first-time attendance, within-year persistence, and year-to-year persistence of the entering class at an urban, public university was created. The model included the following factors: background, achievement, college experiences, and financial aid.

The findings suggested that the logical model proposed was both workable and potentially useful for other institutions. This is significant because the method developed uses only extant data and can be used by any institution. Moreover, the Student Price Response Coefficients (SPRCs) provide the needed linking mechanism between enrollment management and financial planning, which can provide significant guidance to university administrators. This article focuses on the overarching concerns raised by this year-long study of the impact of aid on who enrolls and who persists.[1]

Over the past decade, institutional researchers have disagreed about the impact of student financial aid on attendance and persistence in institutions of higher education. Recent national studies (St. John, 1990c; St. John, Kirshstein & Noell, 1991) indicate that aid has a small, yet consistent impact. At the institutional level, however, there is still some controversy over whether student aid has an effect on matriculation (Voorhees, 1985; and Moline, 1987).

There are several possible explanations for the disagreement over whether student aid is effective (St. John, 1991). First, the logical models used in previous research may not be rigorous enough to measure the effect of aid. Second, the research methodologies in the studies may be inadequate or inconsistent. Third, the research findings may have been interpreted improperly.

This paper proposes and tests a logical model that can be used for institutional research on the enrollment effects of pricing policies, especially student aid policies. The model, derived from the research literature on student choice in higher education, uses extant data sources at an urban public university, and can be replicated by other colleges and universities. This research is important because it allows any institution to study the impact of student financial aid on matriculation, and provides a needed linking mechanism between enrollment management and financial planning.

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Problem Statement

Institutions of higher education need accurate predictions of enrollments to make sound academic and financial policy decisions. Enrollment data include both initial registration and retention. Institutional planners face several dilemmas in designing and applying research on matriculation.

The first and most basic dilemma is which model to use. Existing models have been harshly criticized for their inaccuracy. Where institutional-level research has been done, it is limited in applicability. Second, the research on matriculation uses several different models, methods, and data sources. Researchers are faced with choosing a model and either specially gathering the data or fitting existing data to the model. Third, price response measures may be difficult to develop and interpret. Price information is often based on national studies, which may not be applicable to a particular institution. Planners need guidance on designing and interpreting price response measures for their own institutions.

Early student demand studies examined the variables that affected college matriculation (Corrazinni, Dugan, & Grabowski, 1972; Campbell & Siegel, 1967; Trent & Medskar, 1968; and Barnes, 1970). This early research generally focused on tuition charges only; those that included student aid did not reflect changes in federal policy, like the Pell Grants of the 1970's. Further, some of the studies were cross-sectional (Corrazinni et al, 1972). Price response measures varied from attendance rates (Sewell & Shah, 1967), to elasticity of demand (Campbell & Siegel, 1967), to a standardized price response coefficient (Hoenack & Weiler, 1969).

In the late 1980's, there was a renewed interest in price response research at the national level. In part, this stemmed from changes in federal financial aid policy instituted after 1980, for which data had just become available. However, no measures of price response were developed for use at the institutional level. This new generation of research examines the impact of financial aid on attendance. In one of these studies, differential price response measures were developed (St. John, 1990a). This appraisal found that students are more price responsive to aid (all types) than tuition; low-income students are more responsive to grants than tuition, and are not responsive to loans; middle-income students are more responsive to loans than grants or tuition; and upper-income students are only slightly price responsive to tuition, and are not responsive to aid.

Another study (St. John, 1990b) extends price response to persistence research. He concludes that: 1) students are price responsive (i.e., responsive to price subsidies in the form of aid) in persistence decisions; 2) students are about as price responsive in persistence as they are in attendance; 3) students are consistently responsive to student aid in persistence decisions, but are not responsive to tuition charges; and 4) students are price responsive to all forms of student aid—loans, grants, and work-study awards.

From this body of research, two conclusions emerge. First, student decisions to attend college respond positively to price cuts or increases in financial aid. Second, students' decisions about where to attend

school also are influenced by changes in the relative prices of the alternatives. Thus, price response investigations have implications for financial aid and pricing policies, and for institutional planning.

Due to the ever-increasing cost of college, there has been a renewed interest in price response and its implications for financial aid, pricing policy, and overall institutional planning. Price response does show great promise in helping institutions refine their enrollment management strategies to achieve institutional goals.

Theoretical Framework

The purpose of this study is to create and test a model of matriculation. This logical model allows the researcher to look at many decision points in the matriculation process. The prototype is grounded in research on the economics of education (Becker, 1964; Leslie & Brinkman, 1988), attainment (Alexander & Eckland, 1975; Blau & Duncan, 1967; Wolfle, 1985), access (St. John, 1990a), and persistence (Tinto, 1975; Pascarella & Terenzini, 1980 and 1983; St. John, Kirshstein, and Noell, 1991; and St. John, 1990b).

The matriculation logical model examines the relationships between background, achievement, student financial aid, and college experiences, using three logistical models: first-time attendance, within-year persistence, and year-to-year persistence. The complete list of variables for the three logistical models is contained in Table 1.

Method[2]

The subjects for the enrollment study are the 2,558 admitted applicants to the first-year class for the fall semester of 1989 at an urban, primarily commuter institution of 16,000 students. Most of the student financial aid is federal, with the notable exception of full scholarships for National Merit Finalists ("mondo" scholarships).[3] For the persistence studies, the subjects are the students who entered this same institution as first-year students in the fall of 1989. The data were obtained from extant university sources in the financial aid, admissions, and registrar's offices.

Statistical Method

To describe the relationship between an outcome (dependent) variable and one or more explanatory (independent) variables, statistical regression methods are used. Regression techniques are used to find the "best fit" between the explanatory variables and the outcome variable.

For a model where the outcome variable is dichotomous (such as this study), regular regressions can seriously mis-estimate the dependent variable. Instead, a technique known as logistic regression is used. Since a student chooses to attend or not, and later chooses to persist or not, the outcomes are dichotomous: either yes or no (coded as 1 or 0). The resulting graph of the relationship is not a straight line, but a curved line bounded by 0 and 1.

Delta P

One of the most important questions posed by model users is: will a change in the independent variable have a positive or negative impact on the outcome? This question is answered by computing a statistic

TABLE 1
Variables in the Comprehensive Model*

Common Variables	First-Time Attendance Logistical Model (Unique Variables)	Within-Year Persistence Logistical Model (Unique Variables)	Year-to-Year Persistence Logistical Model (Unique Variables)
Female	Enrolled	Persistence Program (TRIO) Participation	Persistence Program (TRIO) Participation
African-American		Full-Time 1	Full-Time 2
Hispanic		GPA 1-Low	GPA 2-Low
Independent		GPA 1-High	GPA 2-High
Low-Income Aid Applicant		Persistence 1	Persistence 2
Middle-Income Aid Applicant			
High-Income Aid Applicant			
Age			
ACT-Low			
ACT-High			
National Merit			
Any Aid?			
Total Aid $			
Grant $			
Loan $			
Work Study $			
Scholarship $			

*Only the first year of college experience is examined here. A complete analysis of all the years would follow the year-to-year and within-year models with appropriate adjustments made for the amount of aid awarded every year.

called "delta P," which measures the effect on the dependent variable given a change of one unit in a selected independent variable.

Delta-P statistics are used in two ways in this study. First, for dichotomous variables, the delta P provides a measure of the extent to which the outcome is likely to change if an applicant or student has that characteristic. For example, a delta P of 0.061 for African-Americans can be interpreted as increasing the probability of persistence or attendance by 6.1 percentage points for this group.

The second use for the delta-P statistic in this study is for continuous variables. In these cases, the delta P can be interpreted as meaning that a change in a unit measure will change the probability of the outcome by a certain percentage. For example, a delta P of 0.061 per $1,000 of grant aid indicates that the probability of attendance or persistence increases by 6.1 percentage points per $1,000 in grant aid awarded.

Three versions of each logical model are utilized, substituting the following sets of variables for the factor of student financial aid:

1. Aid only (receipt of any aid).
2. Type and dollar amount of aid.
3. Total aid (dollar amount).

By analyzing student financial aid in these three ways, a much richer picture of the complexities of the impact of aid are possible. Moreover, it is possible to assess how the aid variables influence the matriculation decisions of students from varying backgrounds. In addition, this complex analysis makes it possible to study the differing impact of aid at various points in the matriculation process.

The Findings

Tables 2, 3, and 4 present the data from the three logical models. A brief analysis of each follows.

TABLE 2
Comparison of Aid Analysis—First-Time Attendance
Logistical Model

Factor/Variable	Version 1 Any Aid Delta P	Version 2 Aid Amount Delta P	Version 3 Aid Types Delta P
Background			
Female	0.0077	0.0009	0.0065
African-American	−0.2261*	−0.2229*	−0.2086*
Hispanic	0.0672	0.0665	0.0672
Independent	−0.0922	−0.1243**	−0.0954
Low-Income Aid Applicant	−0.0945	0.1031**	0.2119*
Middle-Income Aid Applicant	−0.1944*	0.0656	0.1866*
High-Income Aid Applicant	0.0101	0.1906*	0.2268*
Age	0.0033	0.0046**	0.0029
Achievement			
ACT-Low	−0.0012	0.0020	−0.0013
ACT-High	−0.2177*	−0.1953*	−0.2289*
National Merit	0.2600*	0.2600	***
Financial Aid			
Any Aid?	0.2271*		
Total Aid****		0.0619*	
Aid Types			
Grant $****			−0.0761
Loan $****			−0.0340
Work/Study $****			0.2599
Scholarship $****			0.2355*

*Significance Level = .01 **Significance Level = .05
***Variable omitted because of the high correlation coefficient (.9) with scholarship $.
****These delta P figures represent change per $1,000 in aid offered.

TABLE 3
Comparison of Aid Analysis—Within-Year Persistence Model

Factor/Variable	Version 1 Any Aid Delta P	Version 2 Aid Amount Delta P	Version 3 Aid Types Delta P
Background			
Female	−0.0470**	−0.0461	−0.0414
African-American	0.0710*	−0.0481	0.0506
Hispanic	0.1316*	0.1260*	0.1723*
Independent	0.0714**	0.0590	0.0702
Low-Income Aid Applicant	0.0236	−0.1818*	−0.1170*
Middle-Income Aid Applicant	0.1019**	−0.0133	−0.0261
High-Income Aid Applicant	0.0927	−0.0098	−0.0152
Age	0.0001	−0.0007**	−0.0008
Achievement			
Merit Scholar	0.2200	0.2200	***
ACT-Low	−0.0799**	−0.0773*	−0.0811*
ACT-High	0.0283	0.0235	0.0212
College Experiences			
Persistence Program (TRIO)	0.0751	0.0833	0.0848
Full-Time	0.1805*	0.1782*	0.1785*
GPA-High	0.0911*	0.0928*	0.0924*
GPA-Low	0.0414	0.0400	0.0389
Financial Aid			
Any Aid?	−0.0017		
Total Aid****		0.0495*	
Types and Amounts of Aid			
Grant $****			0.0624*
Loan $****			0.0516*
Work/Study $****			0.0116
Scholarship $****			0.0537**

*Significance Level = .01 **Significance Level = .05
***Variable omitted because of high correlation coefficient (.9) with scholarship $.
****These delta P figures represent change per $1,000 in aid offered.

Analysis, First-Time Attendance Data

For the first-time attendance logistical model, all three of the alternatives for analyzing aid provided insight into student matriculation decisions (Table 2). The inclusion of a marker for receipt of aid illustrated the problems in attracting minority applicants. In addition, this version demonstrated the negative association between being a middle-income aid applicant and first-time attendance, suggesting that this group may not be able to attend college even with financial aid, perhaps because of the "gap" in the aid award or not being able to qualify for aid. Further,

TABLE 4
Comparison of Aid Analysis—Year-to-Year Persistence Model

Factor/Variable	Version 1 Any Aid Delta P	Version 2 Aid Amount Delta P	Version 3 Aid Types Delta P
Background			
Female	−0.0621	−0.0559	−0.0086
African-American	−0.0868	−0.0825	−0.0874
Hispanic	−0.1453	−0.1420	−0.1372
Independent	0.0605	0.0916	0.0882
Low-Income Aid Applicant	0.1165	0.0733	0.0092
Middle-Income Aid Applicant	0.0461	−0.0352	−0.0766
High-Income Aid Applicant	0.1553	0.1023	0.1053
Age	0.0088*	0.0073*	0.0080*
Achievement			
National Merit	−0.7400	−0.7400	***
ACT-Low	0.0250	0.0270	0.0265
ACT-High	−0.0116	−0.0118	0.0071
College Experiences			
Persistence Program (TRIO)	−0.0759	0.0767	0.0823
Full-Time	0.2600	0.2600	0.2600
GPA-High	0.0210	0.0179	0.0251
GPA-Low	0.1283*	0.1301*	0.1267*
Financial Aid			
Any Aid?	−0.2354**		
Total Aid****		−0.0391*	
Types and Amounts of Aid			
Grant $****			0.0046
Loan $****			−0.0317
Work/Study$****			−0.1204
Scholarship $****			−0.2449*

*Significance Level = .01 **Significance Level = .05
***National Merit not included in this version because of correlation coefficient (.9) with scholarship $.
****These delta P figures represent change per $1,000 in aid offered.

scholarships were found to dramatically increase the probability of first-time attendance.

The second version, which substituted the variable total aid, showed the impact of the amount of aid on first-time attendance, with the total amount of aid significantly associated with an increase in first-time attendance for some categories. This model provided a price response measure, with the average accepted applicant 6.2 percentage points more likely to attend per $1,000 in aid awarded. In this analysis, aid applicants from low- and high-income groups were more likely to

attend. However independence had a significant and negative association with first-time attendance. The amount of aid did not influence the significant negative association between first-time attendance and being African-American.

In the third version, the impact of each type of aid was examined. Only merit scholarships were significantly associated with first-time attendance. However, the power of merit scholarship money in attracting well-qualified applicants was demonstrated by the large price response: applicants awarded scholarships were 23.5 percentage points more likely to attend for each $1,000 of aid awarded. However, high scorers on the ACT who did not qualify for the special National Merit Scholarships were much less likely to attend. This suggested that this group of students might be responsive to scholarship awards and that partial scholarships may influence these students to attend.

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In examining trends across the models, several considerations emerge. First, there is a consistent negative association between being African-American and first-time attendance. For this group, the largest negative delta Ps were for the models that included dollar amounts (versions one and two). These figures indicated that not only did the institution have serious problems in attracting African-American applicants, this difficulty was compounded by the size of the aid awards, suggesting that the aid amount and type were insufficient. Second, in versions of the model that included actual dollar amounts, there was generally a positive association between all income groups and first-time attendance for aid applicants. This indicated that to improve access, especially for low- and middle-income students, increasing the amount of aid is important. Third, there is a consistent negative association between top ACT scores and first-time attendance. This may have indicated problems in attracting this group, suggesting that resources might be better spent on attracting other groups such as low-income applicants or applicants who score between the 50th and 70th percentile on the ACT for the applicant group at this institution.

Analysis, Within-Year Persistence Data

The three versions of the within-year persistence logistical model which used student aid variables offer insights into how aid affects persistence. Throughout the three analyses, the variables Hispanic, full-time 1, and GPA 1-high were significantly associated with persistence. The variable ACT-low was also consistently negatively associated with persistence between the first and second semesters.

In two of the three analyses, there were significant associations between within-year persistence and student financial aid. Both of these analyses considered actual dollar amounts rather than mere receipt of aid. When the amount of aid was considered (version two), a student price response coefficient of 5.0 percentage points per $1,000 in aid was found. When the types and amounts of aid were examined (version three), student price response coefficients of 6.2 percentage points per $1,000 in grants and 5.2 percentage points per $1,000 in loans was discovered.

Based on the comparisons between the three versions of the model, five conclusions emerged from these data. First, low-income aid applicants didn't persist as well as others when the amount of aid and the type/amount of were considered. This may reflect the "gap," or unmet financial need of low-income aid applicants. This group of students was very price responsive and additional need-based grants could be effective in promoting their persistence. Second, the total amount of aid offered was significant in promoting within-year persistence for all students. Third, the amount of both grants and loans (which low-income aid applicants received) were significantly associated with persistence. Fourth, women students were less likely to persist when the amount of aid was considered, suggesting that this group may have special needs that could also be met through additional need-based grants. Fifth, African-American students were responsive to both the receipt of aid and the amount of aid. Additional aid, both need-based and merit, could increase the persistence of African-American students.

"In the late 1980s, there was a renewed interest in price response research at the national level."

Analysis, Year-to-Year Persistence Data

In the year-to-year persistence model, not as many of the variables were significantly associated with persistence. On the surface, this may seem that the model is not as useful in predicting persistence as was the within-year persistence model, even though both used the same factors—background, achievement, college experiences, and student financial aid. However, the statistics indicate a model that explains much of the variance of the dependent variable.

Two college experience variables merit mention. First, students in the special persistence program (TRIO) were as likely to persist as all other students. This means that the program is accomplishing its objective. Second, the association between low grade point and persistence may also reflect that these students are persisting at least as well as other students.

Several important points emerged from the assessment of the impact of the various types of student financial aid. First, while the statistic for scholarships (24.5 percentage points less likely to persist per $1,000 in aid) was large, the figure for total aid (4.0 percentage points less likely to persist per $1,000 in aid) was much smaller. This was due to the relatively small number of scholarships awarded and because most of the scholarships were "mondo." The large number of scholarship recipients who did not persist represented a small portion of the total who received aid.

Second, while large scholarships may be useful in attracting students to the institution, there is a high attrition rate associated with these programs. This suggests three things. First, the money may not be as important as the "fit" between the student and the institution. Second, instead of a small number of large scholarships, partial scholarships for a larger number of applicants may be more effective in both attracting and retaining academically strong students who are not superstars. Third, this money could effectively promote persistence of "at risk" students if put into supplemental need-based grants.

Third, there was a consistent positive association between persistence and poor academic performance. This may reflect the policies on continuation that encourage low achieving students to continue to enroll until they are dropped academically. More likely, it suggests that retention programs for "at risk" students were effective.

The three analyses of financial aid were extremely useful. The first two versions indicated a serious negative association between aid and persistence. When the influence of the types of aid was examined, a strong negative association between scholarships and persistence was discovered. These data can be useful in helping the institution examine the awarding of financial aid.

Cross-Model Findings

The logical model is comprehensive, encompassing several choice points in the matriculation process. The analyses of the specific logistical models (full-time attendance, within-year persistence, and year-to-year persistence), generate overarching concerns about particular groups or academic issues that come from a larger view of the research.

Women

Across the models, women are more likely to enroll, but less likely to persist. Moreover, women are more likely to be financially independent and low-income aid applicants, which may understate the association between gender and persistence. Whether the price (amount) or receipt of aid variables are considered, women are less likely to persist than male students. Because of standardized methods for awarding financial aid, this does not indicate gender bias per se. The university should do further research to determine if the need "gap" for this group is larger or if there are special needs for this population that are outside of the model.

Age

Across all of the analyses, there is a significant positive association between age and the dependent variable. The delta Ps for age are usually less than 1 percentage point. However, this indicates the change per year of age. Thus, even a one-point change is significant when comparing the attendance or persistence rates of eighteen-year olds versus twenty-eight-year olds. These figures probably are attributable to older students being "place bound" because of jobs and families, and having fewer choices in institutions.

African-Americans

The analyses show a disturbing trend for African-Americans. As applicants, they are less likely to attend and as students they are less likely to persist. They are sensitive to both any aid and total aid in their matriculation decisions. This suggests that more need-based grants could attract African-American students as well as promote their persistence.

Hispanics

In the persistence analyses, Hispanic students are consistently more likely to persist. Perhaps there are variables outside of the model such as community support systems that influence the persistence of this group.

Academic Performance

The persistence analyses demonstrate that the at-risk students in the special persistence program persist at least as well as all other students. This is an important finding, since it indicates that such programs provide "a level playing field" for these students.

Related to the finding on the persistence program is the significant positive association between low grades and persistence. This suggests several explanations. First, this may indicate that at-risk students are persisting in greater numbers because of the special resources available to them. Second, this may reflect that students with lower grades are reluctant to leave for fear of not being allowed to return. Moreover, they may believe that they can do better academically and remain enrolled. Third, students with higher grade point averages may be more confident about dropping out temporarily. They know that they can return to their institution or other institutions with few penalties. Fourth, there may be academic or financial aid policies that subtly encourage students who are performing poorly to remain in school until they drop out. These four reasons, either individually or in combination, may account for the positive association between low grades and persistence.

"Due to the ever-increasing cost of college, there has been a renewed interest in price response and its implications for financial aid, pricing policy, and overall institutional planning."

Full-Time vs. Part-Time Enrollment

In the persistence analyses there is a consistent positive association between full-time enrollment and persistence. This finding has implications for the institution, an urban, public university with a large part-time enrollment. The data suggest that additional research be done with this group, since their attrition may be due to factors outside of the model like poor academic scheduling and lack of support services at convenient times. If the part-time cohort is important to the institution, then these issues need to be studied and addressed.

Scholarships

The large positive delta P for scholarships (39.4 percentage points more likely to attend per $1,000) for the first-time attendance analysis shows the strong drawing power of this type of aid for the applicant pool of this institution. However, the large negative delta P (26.0 percentage points less likely to persist) for year-to-year persistence indicates a serious mismatch between the resources of the institution and the needs and interests of the students. These large figures are unusual and may reflect factors and conditions outside of the matriculation model. However, the data suggest that while large merit scholarships are effective in attracting students at this urban university, the issue of "fit" is more important than the money in persistence decisions.

For the institution, there are serious questions that should be raised by these statistics. Given the persistence figures, the money could

better have been used to promote the persistence of this population. Additional need-based grants could be established which would have increased the persistence of at-risk students. Large merit scholarships could have been broken into smaller awards which could both attract and retain students who are not superstars, but solid academic performers (Somers, 1993a).

Grants and Loans

In both the attendance and persistence analyses, the dependent variable was positively associated overall with the receipt of grants or loans. This suggests that students are price responsive, especially when non-repayable aid is awarded. If the institutional financial aid resources from mondo scholarships were reallocated, both attendance and persistence could be enhanced by creating additional need-based grants.

ACT Scores

In the first-time attendance analysis, applicants with ACT scores in the top third of applicant pool for this institution were less likely to attend. This suggests that students with stronger academic credentials go elsewhere unless they receive large scholarship awards. The competition for these students from other public institutions as well as second- and third-tier private colleges is intense. The data suggest that if scholarship resources are reallocated, that the group scoring between the 50th and 70th percentile might be responsive to partial scholarship awards.

Who Attends and Who Persists

As the previous section indicates, applicants with ACT scores in the top third of the applicant pool are less likely to enroll. On the other hand, students with lower grade point averages are more likely to persist. These two statistics paint a troubling picture. Not only do better students choose not to attend the institution, students who are stronger academic performers are also more likely to leave the institution. Again this suggests a strategy of pursuing the middle range of the applicant pool—solid academic performers who with small scholarships might be influenced to attend the institution and who might persist in larger numbers.

Implications

The conclusions from this research suggest implications for the institutional policy of the university studied. The findings on who enrolls and who persists can be important in shaping institutional policy in financial aid and academic affairs.

First, there are important implications about the first-time attendance and persistence of low-income students. In the first-time attendance study, there was generally a significant, positive association between being a low-income aid applicant and first-time attendance. This means that student financial aid is important in attracting this group to the institution. However, the findings for persistence are almost the reverse. For within-year persistence, low-income aid applicants are less likely to persist, and there is a negative association between the receipt of aid and being in this group. For year-to-year persistence,

there is no significant association between being a low-income aid applicant and persistence.

This might imply that while many low-income aid applicants assume that the aid award is sufficient to pay their expenses after the first semester, some leave for what appears to be financial reasons. This suggests there is a "gap" between the aid award and the true cost of attendance. Unfortunately, since the institution relies mainly on federal funds for financial aid for this group of students, there is little flexibility in the amount of the award. Redistributing institutional aid to this group could promote persistence.

Second, the institution has difficulty in attracting students who score on the upper third of the ACT who are not National Merit Finalists. These students represent the solid academic performer that the university needs to attract. However, the competition for these students is intense. Because they can offer these students subsidized scholarships, second- and third-tier private colleges may be inducing these applicants in larger numbers.

"There were significant associations between within-year persistence and student financial aid."

Third, the National Merit scholarship program has mixed results. Initially, the scholarship attracts National Merit Scholars to the institution. However, they leave the university in large numbers between the first and second years. Thus, once the initial "aura" of a full scholarship wanes, the hard realities of providing a good academic match for these students emerge. This suggests that the institution needs to carefully consider the importance of this program and the true cost of the resources needed to make it work.

A separate "what if" analysis (Somers, 1993a), estimates the impact of redistributing this aid in different ways. For first-time enrollment, if the money had been redistributed across the accepted applicant pool, an estimated 134 more students would have enrolled. If the money were redistributed to low-income applicants as grants, 201 more students would have enrolled. The second scenario examined within-year persistence. If all of the money had been redirected into grants, 138 more students would have persisted. If scholarship dollars had been put into loans, 117 more would have persisted. Finally, if the money had been divided into smaller scholarships, an estimated 123 more students would have persisted. The third scenario estimates the impact of reallocating scholarship funds on year-to-year persistence. If the money had been put into grants, 112 more students would have persisted.

Fourth, the results of this study show that aid does make a difference in first-time attendance and persistence. This has implications for the institution in crafting a financial aid policy that maximizes certain objectives such as persistence. While the university relies primarily on federal financial aid, funds for campus-based programs and the National Merit scholarships are within the control of the institution and could be allocated differently.

Fifth, a careful examination of the needs of women students should be undertaken. From these data, it is clear that they persist in lower numbers than men. While aid is a factor in these decisions, there also may be factors outside of this model that should be addressed.

Sixth, African American students were less likely to enroll and persist as compared to all other students. Those students were sensitive to the receipt of any aid and to total aid dollars. This has important implications for institutional policy on financial aid if the university seeks to admit and retain more African American students.

Seventh, while the positive association between full-time attendance and persistence is expected, it should be examined in the broader context of the university mission. Academic policies, schedules, and lack of support services at convenient hours may be factors which influence the attrition of part-time students.

The results of the study may be of interest to other public urban universities, since the applicant population and financial aid policies may be similar. In addition, the findings on "high stakes" scholarships have broad application to many colleges and universities, demonstrating that the match between student and institution is probably more important than the amount of money offered.

Future Research

This study indicates the need for more institutional research on the impact of student financial aid on first-time attendance and persistence. The collection of data from many schools would allow for comparison of price response coefficients for the current year and over a period of time. In addition, it would permit analysis of variations between both comparable schools and all institutions.

Research done at the institutional level has a great advantage over national research because data cannot be collected quickly enough at the national level to promote iterative research and planning processes. Institutional research can provide a crucial missing link for many colleges in the planning process which could make them more competitive and serve their students better. ✦

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Notes

[1]The research presented here was supported by a grant from the National Association of Student Financial Aid Administrators.

[2]For a "how to" description of the methodology, see St. John & Somers, in press and Somers & St. John, in press.

[3]The term "mondo scholarships" was first coined by the author's daughter, a National Merit Finalist and "Academic All-American," for the outrageously large merit scholarships offered to attract such high-achieving students.